

Caching,  
Weapons Burial  
Containers

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H.B. 95

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December 30, 1957

Dear Sir:

This summary letter report describes the work done under Work Order No. XIV, Task Order No. A, during the period from June 28 through September 27, 1957.

Under this program, three modifications for the prototype rectangular-cross-sectioned container developed under Task Order No. D were investigated. The modifications included a new type of lid latch that facilitated opening and closing the containers, a means of securing the lid to the opened container so as to prevent loss of the lid, and a new type of handle bracket. On the basis of the results obtained, two of the three Task Order No. D containers were modified; it was not considered worth while to modify the third prototype container since it was badly deformed as a result of strength tests conducted on it under Task Order No. D.

On May 29, 1956, Task Order No. D was undertaken to develop a rectangular-cross-sectioned container which could be used for underground burial and which was expected to satisfy several requirements. These requirements are discussed in detail in our proposal dated April 23, 1956, and in the Summary Report on Task Order No. D, dated April 30, 1957. The effort on that program resulted in three prototype containers which satisfied the originally indicated requirements. During May, 1957, the Sponsor inspected the prototype

25X1

**CONFIDENTIAL**

-2-

December 30, 1957

~~CONFIDENTIAL~~

containers and suggested that further investigation of selected design features would be desirable. As a result, Work Order No. XIV, Task Order No. A, was undertaken on June 28, 1957.

The objective of the Work Order No. XIV research program was to investigate three design features of the prototype container and to modify the prototype containers to include any of the desirable resulting design changes.

The first phase of this investigation was concerned with the removal of the container lid. Although the lid could be easily inserted and removed when the O-ring was adequately lubricated, a lack of lubrication or the break-out friction which occurs with seals that are static for a long period of time made the lid difficult to install or remove, respectively.

Initially, mechanisms for prying the lid from the container were prepared and evaluated. These prying mechanisms, which applied a force on the long sides of the lid, were adaptations of the toggle-type lid latch that was used on the prototype container. Tests with these mechanisms showed that this type of removal mechanism would not operate satisfactorily. Subsequent evaluation studies, however, revealed that, when a prying pressure was applied to the ends or short sides of the lid, it was relatively easy to remove the lid from the container. As a result of these studies, a lever-type latch was designed to operate at the ends or short sides of the lid. Evaluation of the performance of the new latch indicated that it greatly facilitated the removal or insertion of the lid even when lubricant was not used on the O-ring.

~~CONFIDENTIAL~~

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CONFIDENTIAL

December 30, 1957

Figure 1 illustrates the new lever-type latch in the closed position. The latch consists of three parts: the two prying levers with one end of each hinged to the container flange, and the toggle fastener which secures the free ends of the levers when the container is closed. Figures 2, 3, and 4 illustrate additional details of these parts and also the method of opening the container. As shown, after the toggle fastener is released, the levers are pulled toward a vertical position. This action causes the short lever lips, which extend underneath the lid, to force the lid out of the container. After the lid is free, the levers are dropped down at the side of the container, as indicated in Figure 4.

The same latch can be used to advantage in installing the lid. This operation is shown in Figures 5 and 6; it will be noted particularly that a different portion of the prying levers is used for this purpose.

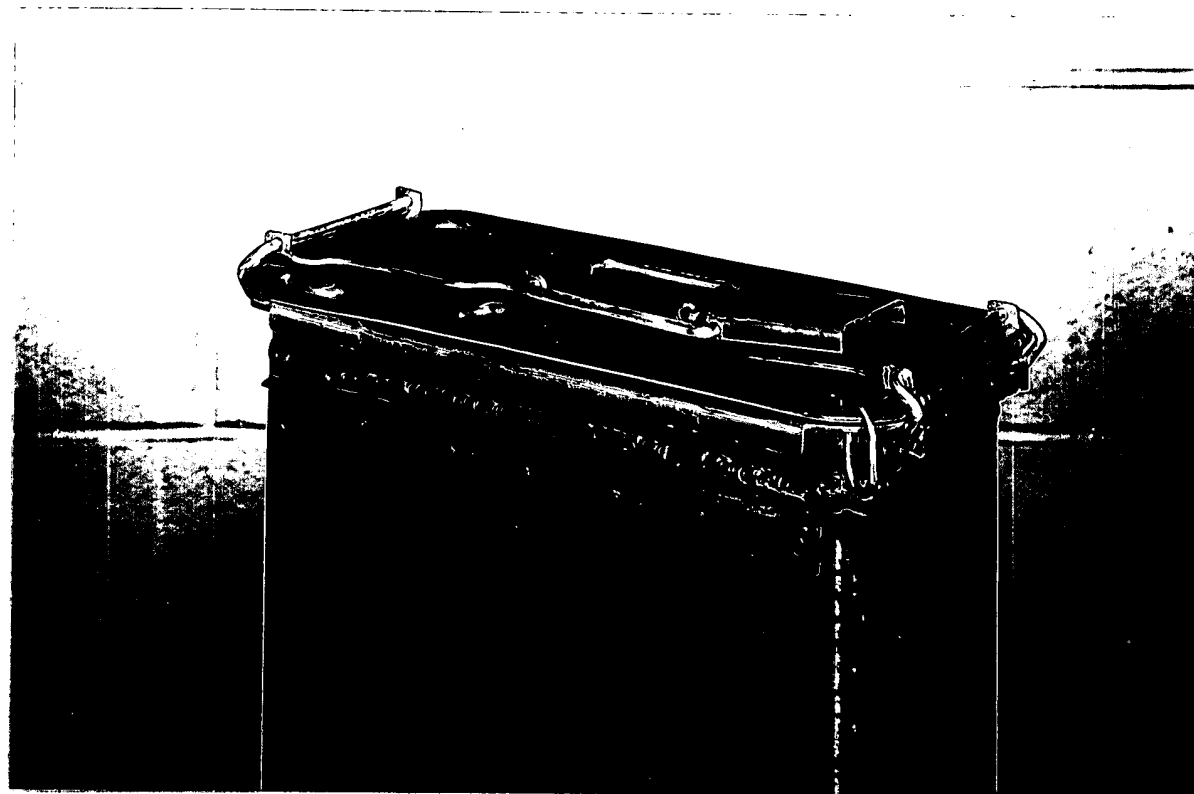
The second phase of the program was concerned with the development of a means of holding the lid to the container after the opening operation, so as to prevent the loss of the lid. A number of ideas including the use of chain and cable were considered. However, we decided that the simplest method would be to drill a 3/16-inch-diameter hole in the lips of both the lid and the flange, to insert a partially bent loop of 1/8-inch-diameter stainless steel rod through the two holes, and then to bend the loop closed and

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-4-

December 30, 1957



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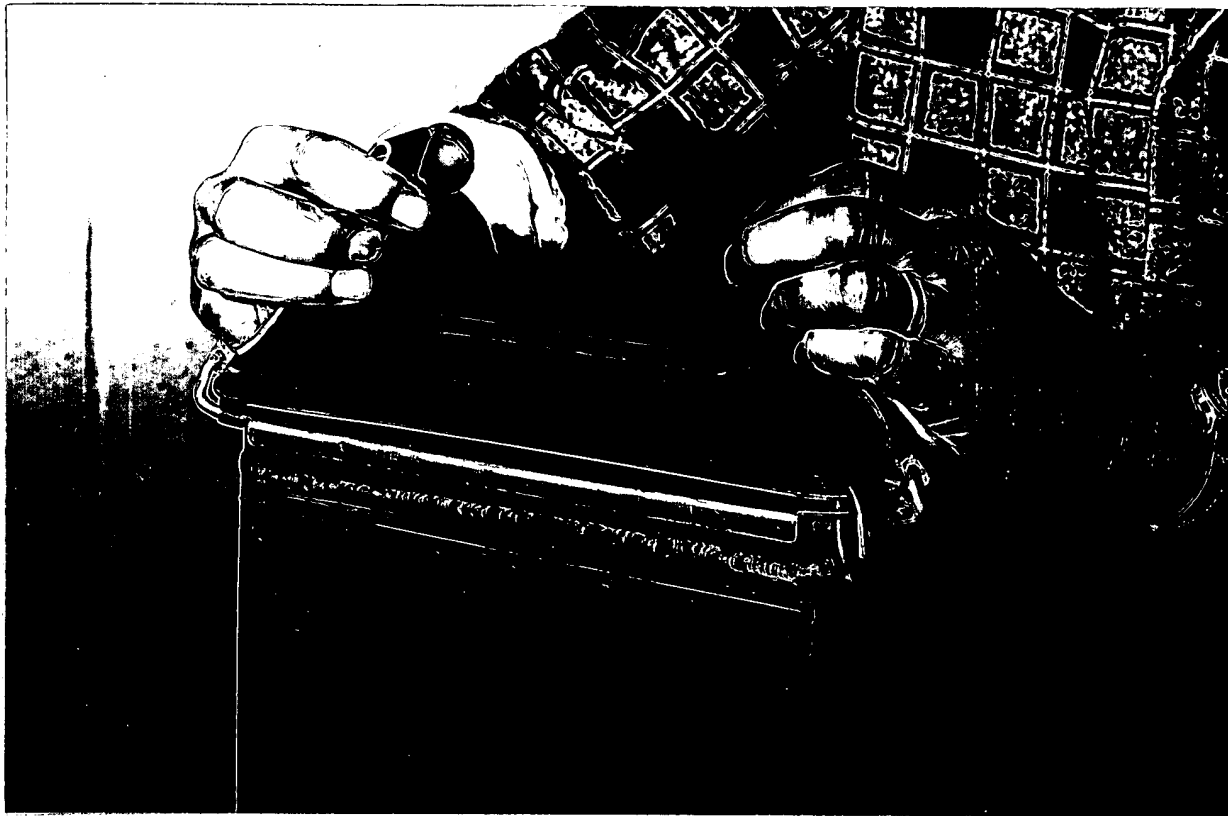
**Figure 1. Lever-Type Latch in the Closed and Latched Position**

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-5-

December 30, 1957



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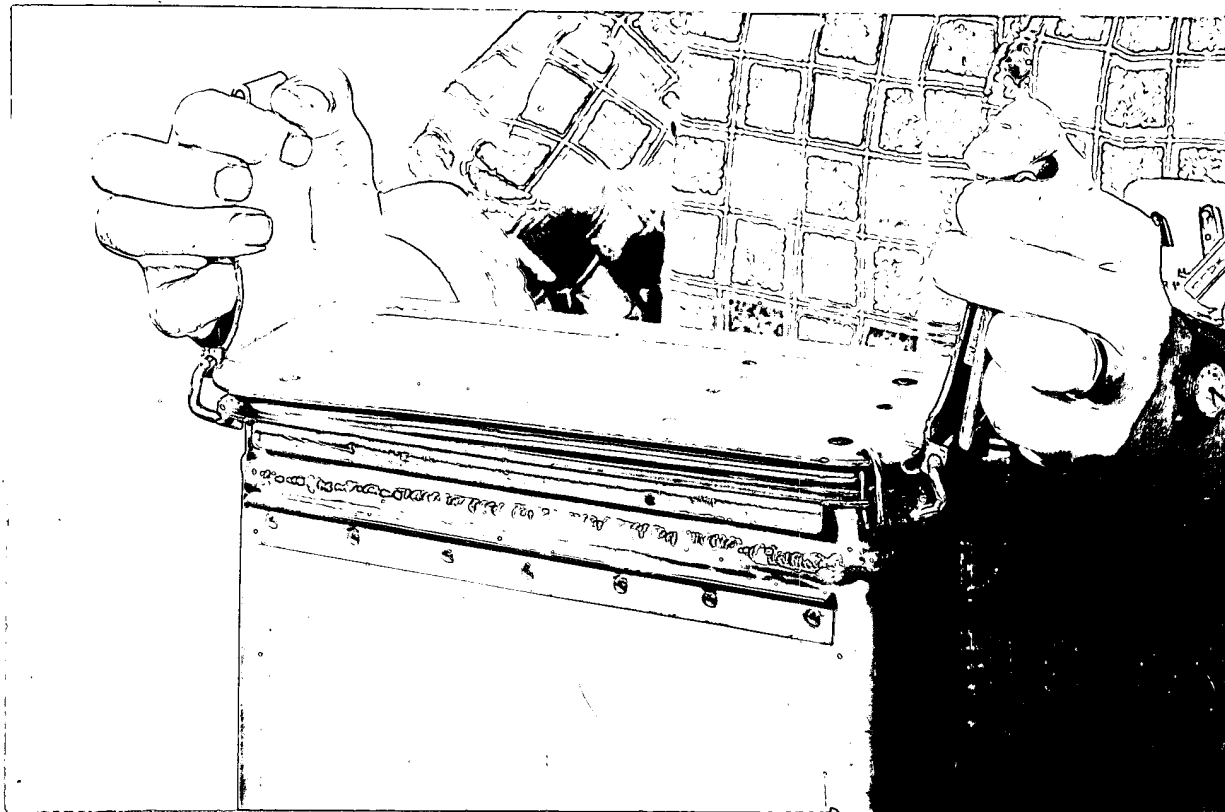
**Figure 2. Lever-Type-Latch Opening Operation, With the Lid in the Partially Opened Position**

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-6-

December 30, 1957



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**Figure 3. Lever-Type-Latch Opening Operation,  
With the Lid in the Open Position**

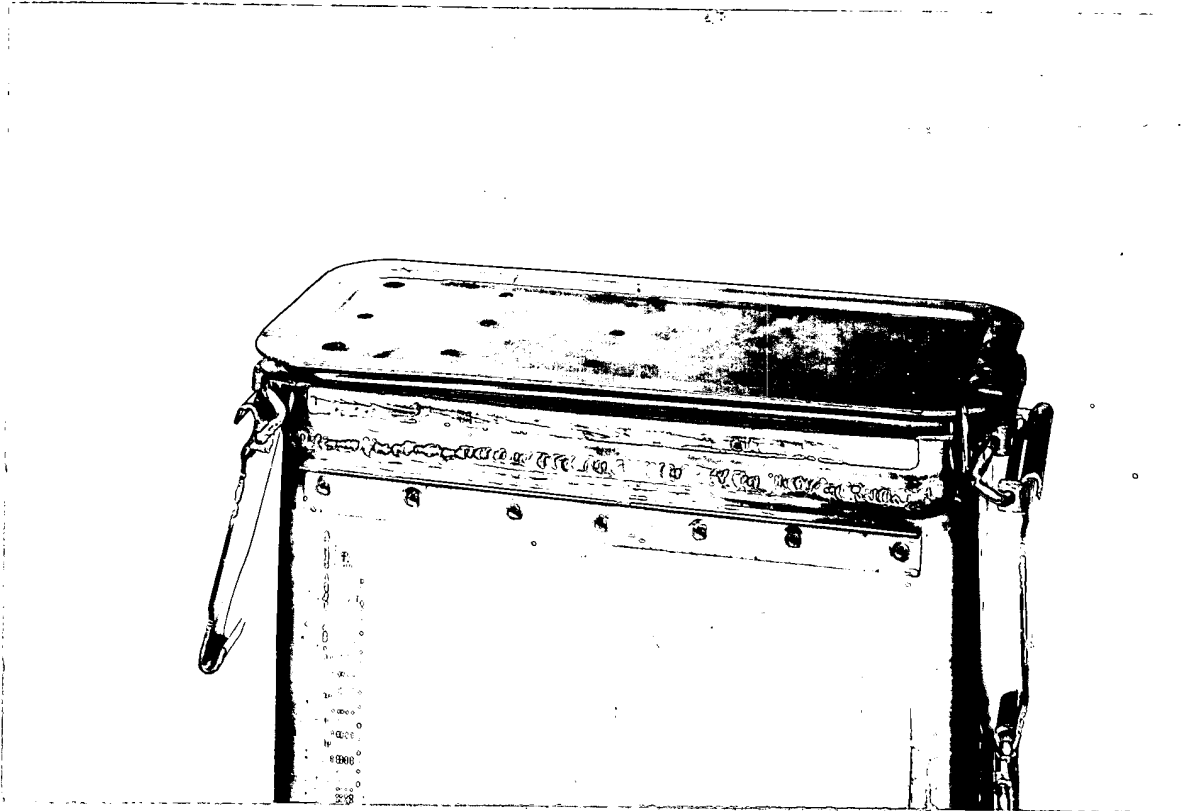
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-7-

December 30, 1957



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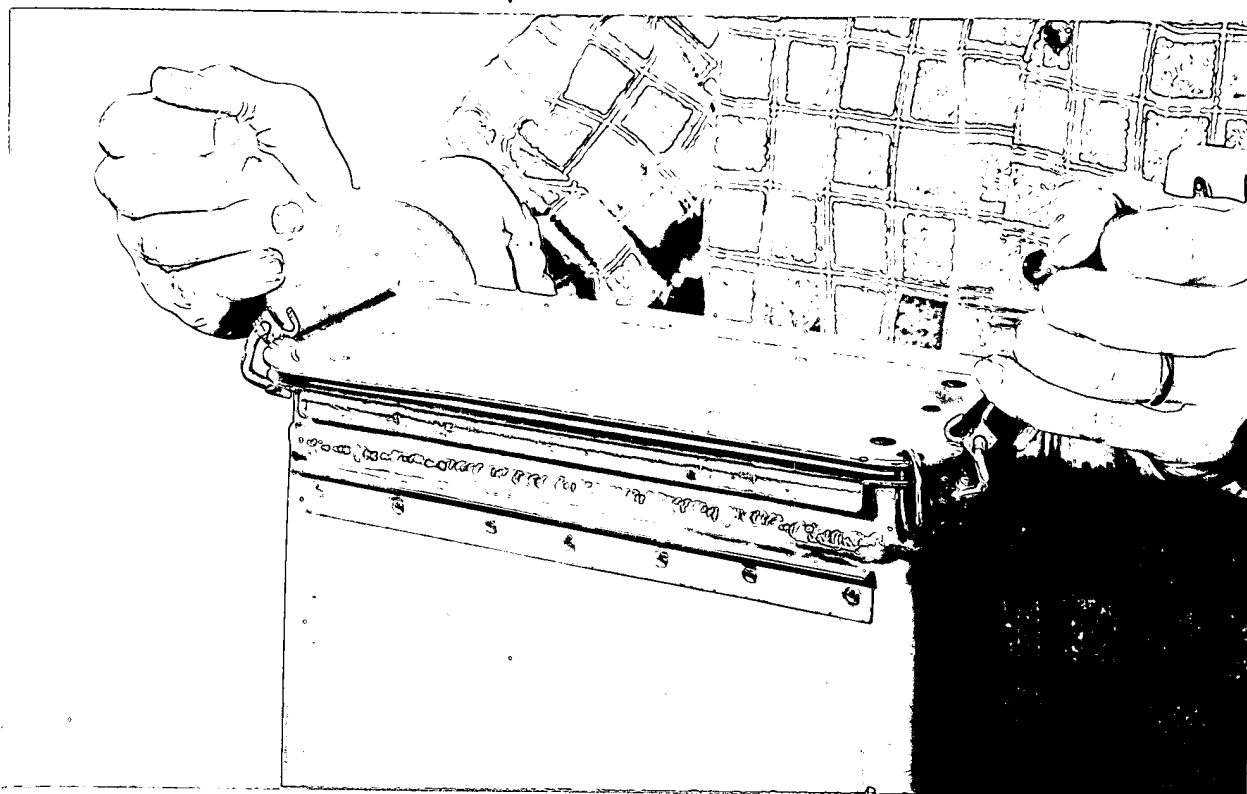
**Figure 4. Lever-Type Latch Hanging Down at the Sides of the Container, With the Lid in the Open Position**

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SECRET

-8-

December 30, 1957



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Figure 5. Lever-Type-Latch Closing Operation, With the Lid in the Partially Closed Position

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-9-

December 30, 1957



N45158

**Figure 6. Lever-Type-Latch Closing Operation,  
With the Lid in the Closed Position**

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SECRET

-10-

December 30, 1957

weld the ends using stainless steel electrodes. Figure 7 shows the lid being supported by the loop.

The third phase of this program was concerned with a study of the container handle and handle-bracket design. As shown in Figure 8, the handles of the prototype container were attached to the container by formed stainless steel strips welded to the container body. As a result of this bracket design and method of attachment, there were crevices between the brackets and the container, and these might be conducive to accelerated corrosion of the container body during underground burial. In order to eliminate these crevices and the possibility of associated crevice corrosion, the handle bracket was redesigned. Figure 9 shows the new handle-bracket design; the bracket is an angle-shaped stainless steel part with one leg welded to the container body using stainless steel electrodes and the other leg drilled to receive the handle. This design eliminates the problem of crevice corrosion at the container body because weld metal is deposited along all four sides of the leg that contacts the container and thus no crevices occur.

In accordance with a recent discussion with the Sponsor, a proposal was prepared that provided for the preparation of 10 rectangular-cross-sectioned containers which would include the modifications described above, and of a set of working drawings. As of December 19, 1957, this program was initiated under Task Order No. S.

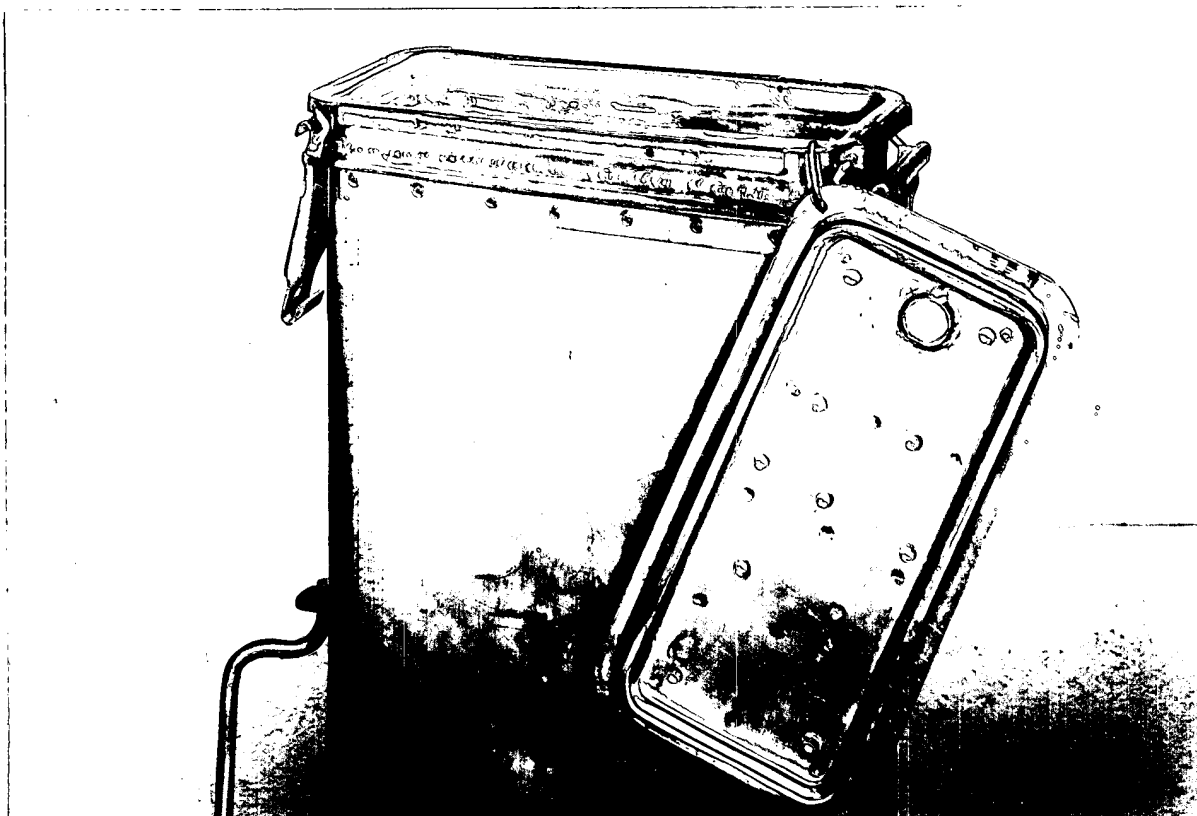
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-11-

December 30, 1957



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Figure 7. The Lid Removed From the Container and Supported by the Loop

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-12-

December 30, 1957



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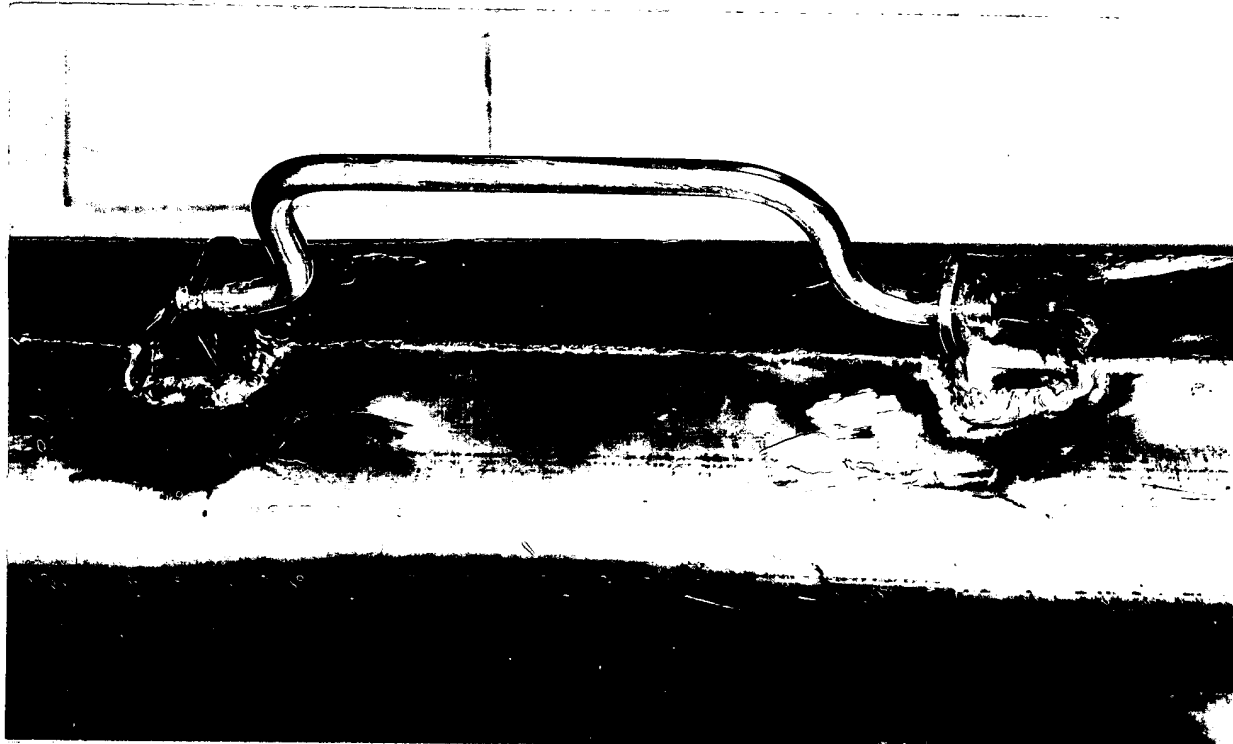
**Figure 8. Handle Brackets on Prototype Container**

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December 30, 1957



N45156

Figure 9. New Handle-Bracket Design

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-14-

December 30, 1957

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We would appreciate any comments that you or your associates might care to make with regard to the activity under this Work Order.

Sincerely,

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ABW:mjc

In Triplicate

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